

WHAT IS CLAIMED IS:

1. A semiconductor device comprising:

5 a thin film transistor comprising a semiconductor layer on an insulating surface, an insulating film on said semiconductor layer and a gate electrode on said insulating film;

a plurality of projected portions on said insulating surface;

10 an interlayer insulating film covering said thin film transistor and said projected portions, said interlayer insulating film having a projected and recessed surface; and

a pixel electrode electrically connected to said thin film transistor, said pixel electrode having a projected and recessed surface on said interlayer insulating film.

15 2. The semiconductor device according to claim 1, wherein said projected portions comprise a same material as one selected from the group consisting of a semiconductor layer, a gate electrode, and a gate insulating film of said thin film transistor.

20 3. The semiconductor device according to claim 1, wherein said projected portions have different heights or different shapes.

25 4. The semiconductor device according to claim 1, wherein said pixel electrode comprises one selected from the group consisting of Al, Ag, and a lamination of Al and Ag.

30 5. The semiconductor device according to claim 1, further comprising a first light shielding portion comprising laminated layers of a first color layer and a second color layer; and
a second light shielding portion comprising laminated layers of said first

color layer and a third color layer;

wherein said first light shielding portion and said second light shielding portion are formed to overlap in an interval between an arbitrary one of said pixel electrode and said pixel electrode contiguous to said arbitrary one of said pixel electrode.

6. The semiconductor device according to claim 5, wherein said first color layer comprises a red color, said second color layer comprises a blue color, and said third color layer comprises a green color.

7. The semiconductor device according to claim 5, wherein said first light shielding portion and said second light shielding portion are provided over an opposed substrate.

8. The semiconductor according to claim 1, wherein said semiconductor device is a reflection type liquid crystal display device.

9. The semiconductor device according to claim 1, wherein said semiconductor device is one selected from the group consisting of a personal computer, a video camera, a mobile computer, a portable telephone, a goggle-type display, a digital camera, and a portable electronic book.

10. A semiconductor device comprising:
a thin film transistor comprising a semiconductor layer on an insulating surface, an insulating film on said semiconductor layer and a gate electrode on said insulating film;

a plurality of projected portions on said insulating surface; and

a pixel electrode in contact with said projected portions, said pixel electrode having a projected and recessed surface and electrically connected to said thin film transistor.

11. The semiconductor device according to claim 10, wherein said projected portions comprise a same material as one selected from the group consisting of a semiconductor layer, a gate electrode, and a gate insulating film
5 of said thin film transistor.

12. The semiconductor device according to claim 10, wherein said projected portions have different heights or different shapes.

10 13. The semiconductor device according to claim 10, wherein said pixel electrode comprises one selected from the group consisting of Al, Ag, and a lamination of Al and Ag.

14. The semiconductor device according to claim 10, further comprising
15 a first light shielding portion comprising laminated layers of a first color layer and a second color layer; and

a second light shielding portion comprising laminated layers of said first color layer and a third color layer;

wherein said first light shielding portion and said second light shielding
20 portion are formed to overlap in an interval between an arbitrary one of said pixel electrode and said pixel electrode contiguous to said arbitrary one of said pixel electrode.

15. The semiconductor device according to claim 14, wherein said first
25 color layer comprises a red color, said second color layer comprises a blue color, and said third color layer comprises a green color.

16. The semiconductor device according to claim 14, wherein said first
light shielding portion and said second light shielding portion are provided over
30 an opposed substrate.

17. The semiconductor according to claim 10, wherein said semiconductor device is a reflection type liquid crystal display device.

5 18. The semiconductor device according to claim 10, wherein said semiconductor device is one selected from the group consisting of a personal computer, a video camera, a mobile computer, a portable telephone, a goggle-type display, a digital camera, and a portable electronic book.

10 19. A semiconductor device comprising:
a thin film transistor comprising a semiconductor layer on an insulating surface, an insulating film on said semiconductor layer and a gate electrode on said insulating film;

15 a plurality of projected portions on said insulating film;
an interlayer insulating film covering said thin film transistor and said projected portions, said interlayer insulating film having a projected and recessed surface; and

20 a pixel electrode electrically connected to said thin film transistor, said pixel electrode having a projected and recessed surface on said interlayer insulating film.

20. The semiconductor device according to claim 19, wherein said projected portions have different heights or different shapes.

25 21. The semiconductor device according to claim 19, wherein said pixel electrode comprises one selected from the group consisting of Al, Ag, and a lamination of Al and Ag.

30 22. The semiconductor device according to claim 19, further comprising a first light shielding portion comprising laminated layers of a first color layer

and a second color layer; and

a second light shielding portion comprising laminated layers of said first color layer and a third color layer;

wherein said first light shielding portion and said second light shielding
5 portion are formed to overlap in an interval between an arbitrary one of said pixel electrode and said pixel electrode contiguous to said arbitrary one of said pixel electrode.

23. The semiconductor device according to claim 22, wherein said first
10 color layer comprises a red color, said second color layer comprises a blue color, and said third color layer comprises a green color.

24. The semiconductor device according to claim 22, wherein said first
15 light shielding portion and said second light shielding portion are provided over an opposed substrate.

25. The semiconductor according to claim 19, wherein said semiconductor device is a reflection type liquid crystal display device.

26. The semiconductor device according to claim 19, wherein said
20 semiconductor device is one selected from the group consisting of a personal computer, a video camera, a mobile computer, a portable telephone, a goggle-type display, a digital camera, and a portable electronic book.

27. A semiconductor device comprising:
25 a thin film transistor comprising a semiconductor layer on an insulating surface, an insulating film on said semiconductor layer and a gate electrode on said insulating film;

a plurality of projected portions on said insulating film; and

30 a pixel electrode in contact with said projected portions, said pixel

electrode having a projected and recessed surface and electrically connected to said thin film transistor.

28. The semiconductor device according to claim 27, wherein said
5 projected portions comprise a same material as one selected from the group consisting of a semiconductor layer, a gate electrode, and a gate insulating film of said thin film transistor.

29. The semiconductor device according to claim 27, wherein said
10 projected portions have different heights or different shapes.

30. The semiconductor device according to claim 27, wherein said pixel
15 electrode comprises one selected from the group consisting of Al, Ag, and a lamination of Al and Ag.

31. The semiconductor device according to claim 27, further comprising
a first light shielding portion comprising laminated layers of a first color layer
and a second color layer; and

a second light shielding portion comprising laminated layers of said first
20 color layer and a third color layer;

wherein said first light shielding portion and said second light shielding
portion are formed to overlap in an interval between an arbitrary one of said
pixel electrode and said pixel electrode contiguous to said arbitrary one of said
pixel electrode.

32. The semiconductor device according to claim 31, wherein said first
25 color layer comprises a red color, said second color layer comprises a blue color,
and said third color layer comprises a green color.

30 33. The semiconductor device according to claim 31, wherein said first

light shielding portion and said second light shielding portion are provided over an opposed substrate.

34. The semiconductor according to claim 27, wherein said
5 semiconductor device is a reflection type liquid crystal display device.

35. The semiconductor device according to claim 27, wherein said
semiconductor device is one selected from the group consisting of a personal
computer, a video camera, a mobile computer, a portable telephone, a
10 goggle-type display, a digital camera, and a portable electronic book.

36. A method of fabricating a semiconductor device comprising the
steps of:

forming a semiconductor layer on an insulating surface;

15 forming a first insulating film on said semiconductor layer;

forming a conductive layer overlapping said semiconductor layer on
said first insulating film;

forming a projected portion comprising a laminated structure of said
semiconductor layer, said first insulating film, and said conductive layer;

20 forming a second insulating film covering at least said projected
portion; and

forming a pixel electrode on said second insulating film,

wherein said pixel electrode overlaps said projected portion and
includes projected and recessed portions on a surface thereof.

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37. The method according to claim 36, wherein said semiconductor
device is a reflection type liquid crystal display device.

38. The method according to claim 36, wherein said pixel electrode
30 comprises one selected from the group consisting of Al, Ag, and a lamination of

Al and Ag.

39. The method according to claim 36, wherein a thin film transistor is formed by a same step as that of forming said projected portion.

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40. The method according to claim 36, wherein said pixel electrode is connected to a thin film transistor formed by a same step as that of forming said projected portion.

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41. The method according to claim 36, wherein said semiconductor device is one selected from the group consisting of a personal computer, a video camera, a mobile computer, a portable telephone, a goggle-type display, a digital camera, and a portable electronic book.

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42. A method of fabricating a semiconductor device comprising the steps of:

forming a first insulating film on an insulating surface;

forming a conductive layer on said first insulating film;

forming a projected portion comprising a laminated structure of said

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first insulating film and said conductive layer;

forming a second insulating film covering at least said projected portion; and

forming a pixel electrode on said second insulating film;

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wherein said pixel electrode overlaps said projected portion and includes projected and recessed portions on a surface thereof.

43. The method according to claim 42, wherein said semiconductor device is a reflection type liquid crystal display device.

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44. The method according to claim 42, wherein said pixel electrode

comprises one selected from the group consisting of Al, Ag, and a lamination of Al and Ag.

45. The method according to claim 42, wherein a thin film transistor is
5 formed by a same step as that of forming said projected portion.

46. The method according to claim 42, wherein said pixel electrode is
connected to a thin film transistor formed by a same step as that of forming said
projected portion.

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47. The method according to claim 42, wherein said semiconductor
device is one selected from the group consisting of a personal computer, a video
camera, a mobile computer, a portable telephone, a goggle-type display, a digital
camera, and a portable electronic book.

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48. A method of fabricating a semiconductor device comprising the
steps of:

forming a conductive layer on an insulating surface;

forming a projected portion comprising said conductive layer;

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forming an insulating film covering at least said projected portion; and

forming a pixel electrode on said insulating film;

wherein said pixel electrode overlaps said projected portion and
includes projected and recessed portions on a surface thereof.

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49. The method according to claim 48, wherein said semiconductor
device is a reflection type liquid crystal display device.

50. The method according to claim 48, wherein said pixel electrode
comprises one selected from the group consisting of Al, Ag, and a lamination of
30 Al and Ag.

51. The method according to claim 48, wherein a thin film transistor is formed by a same step as that of forming said projected portion.

5 52. The method according to claim 48, wherein said pixel electrode is connected to a thin film transistor formed by a same step as that of forming said projected portion.

10 53. The method according to claim 48, wherein said semiconductor device is one selected from the group consisting of a personal computer, a video camera, a mobile computer, a portable telephone, a goggle-type display, a digital camera, and a portable electronic book.